

Achievement Standard

Subject Reference Mathematics and Statistics 3.8

Title Investigate time series data

Level 3 **Credits** 4 **Assessment** Internal

Subfield Statistics and Probability

Domain Statistics

Status Registered **Status date** 4 December 2012

Planned review date 31 December 2019 **Date version published** 17 November 2016

This achievement standard involves investigating time series data.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> Investigate time series data. 	<ul style="list-style-type: none"> Investigate time series data, with justification. 	<ul style="list-style-type: none"> Investigate time series data, with statistical insight.

Explanatory Notes

1 This achievement standard is derived from Level 8 of *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007; and is related to the achievement objective:

- Carry out investigations of phenomena, using the statistical enquiry cycle:
 - using existing data sets
 - finding, using, and assessing appropriate models (including additive models for time-series data), seeking explanations, and making predictions
 - using informed contextual knowledge
 - communicating findings and evaluating all stages of the cycle

in the Statistics strand of the Mathematics and Statistics Learning Area. It is also related to the material in the *Teaching and Learning Guide for Mathematics and Statistics*, Ministry of Education, 2012, at <http://seniorsecondary.tki.org.nz>.

This standard is also derived from *Te Marautanga o Aotearoa*. For details of the *Marautanga* achievement objectives to which this standard relates, see the [Māori version](#) of the standard.

- 2 *Investigate time series data* involves showing evidence of using each component of the statistical enquiry cycle.

Investigate time series data, with justification involves linking components of the statistical enquiry cycle to the context, and referring to evidence such as statistics, data values, trends, or features of visual displays in support of statements made.

Investigate time series data, with statistical insight involves integrating statistical and contextual knowledge throughout the statistical enquiry cycle, and may include reflecting about the process; considering other relevant variables; evaluating the adequacy of any models; or showing a deeper understanding of models.

- 3 Using the statistical enquiry cycle to investigate time series data involves:

- using existing data sets
- selecting a variable to investigate
- selecting and using appropriate display(s)
- identifying features in the data and relating this to the context
- finding an appropriate model
- using the model to make a forecast
- communicating findings in a conclusion.

- 4 Conditions of Assessment related to this achievement standard can be found at www.tki.org.nz/e/community/ncea/conditions-assessment.php.
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Replacement Information

This achievement standard replaced unit standard 5257 and AS90641.

Quality Assurance

- 1 Providers and Industry Training Organisations must have been granted consent to assess by NZQA before they can register credits from assessment against achievement standards.
- 2 Organisations with consent to assess and Industry Training Organisations assessing against achievement standards must engage with the moderation system that applies to those achievement standards.

Consent and Moderation Requirements (CMR) reference

0233

Paerewa Paetae

Aronga Pāngarau 3.8

Ingoa Te tūhura i te raraunga houanga

Kaupae 3 **Whiwhinga** 4 **Aromatawai** Ā-roto

Marau akoranga Te Marautanga o Aotearoa

Kokonga akoranga Pāngarau

Mana rēhita Kua rēhitatia **Te rā i mana ai** 4 Hakihea 2012

Te rā e arotakengia ai 31 Hakihea 2018 **Te rā i puta ai** 17 Whiringa-ā-rangi 2016

Te Hononga ki te Marautanga

I ahu mai tēnei paerewa paetae i te Taumata 8 o *Te Marautanga o Aotearoa*, i whakaputaina e Te Pou Taki Kōrero i te tau 2008.

Whāinga Paetae

Te Tauanga, Te Tūhuratanga Tauanga

1 *Ka whai i ngā tikanga mō te tūhuratanga tauanga:*

- *ka whakahaere tirohanga tauanga, whakamātau tauanga rānei, mā te whakamahi tikanga whakamahere whakamātau tauanga, ka whakamahi rānei i ngā huinga rarauanga kua oti kē te kōhi mai;*
- *ka whiriwhiri, ka whakamahi, ka arotake i ngā tauira tauanga e whaihua ana ki te whakatakoto matapae, ki te kimi whakamārama (pērā i te ine hononga taurangi rārangi mō te raraunga matarua, me te tauira tāpiripiri mō te raraunga houanga);*
- *ka whakamahi mōhiotanga ki te horopaki o te tūhuratanga, ka whakamahi tikanga tātari hōpara, ka whakamahi tikanga hīkaro tauanga;*
- *ka whakamārama i ngā whakakitenga, ka arotake i ngā wāhanga katoa o te tūhuratanga;*
- *ka mārama ki ngā tikanga matatika e hāngai ana.*

E hono ana ki te Papa Whakaako mō te Pāngarau kei te pae tukutuku nei:

<http://tmoa.tki.org.nz/Te-Marautanga-o-Aotearoa-Taumata-Matauranga-a-Motu-Ka-Taea>

Te Hononga ki *The New Zealand Curriculum* (NZC)

I ahu mai hoki tēnei paerewa paetae i *The New Zealand Curriculum*. Mō ngā kōrero e pā ana ki ngā whāinga paetae o te NZC e hāngai ana ki tēnei paerewa, tirohia te [putanga reo Pākehā](#) o te paerewa.

Te Hononga ki ngā Tikanga Aromatawai

Arā ngā Tikanga Aromatawai mō tēnei paerewa paetae, kei te:

<http://tmoa.tki.org.nz/Te-Marautanga-o-Aotearoa/Taumata-Matauranga-a-Motu-Ka-Taea>

Paerewa Paetae

<p>Paetae Te tūhura i te raraunga houanga.</p>	<p>Hei tohu i te paetae:</p> <ul style="list-style-type: none"> • Ka whakamahi huinga raraunga kua oti te kōhi. • Ka whiriwhiri i tētahi taurangi hei tūhura. • Ka kimi i tētahi ture whaitake hei tūhura i te raraunga. • Ka whakamahi mōhiotanga ki te horopaki. • Ka whakatakoto matapae. • Ka whakamārama i ngā kitenga, ka arotake i ngā wāhanga katoa o te tūhuratanga.
<p>Kaiaka He kaiaka te tūhura i te raraunga houanga.</p>	<p>Hei tohu i te kaiaka:</p> <ul style="list-style-type: none"> • Ka honohono i ngā wāhanga o te tūhuratanga ki te horopaki, me te hono ki ngā taunaki pērā i te tauanga, te uara o te raraunga, ngā piki me ngā heke, ngā āhuetanga rānei o ngā whakaatahanga tauanga hei tautoko i ngā kīanga.
<p>Kairangi He kairangi te tūhura i te raraunga houanga.</p>	<p>Hei tohu i te kairangi:</p> <ul style="list-style-type: none"> • Ka tūhonohono mātauranga tauanga me te mātauranga horopaki puta noa i te tūhuratanga (tērā pea ka whai take te āta whakaaroaro ki te tukunga, ki ērā atu taurangi, te pai o te ture me te whakaatu mōhiotanga hōhonu ki ērā atu ture). • Ka whaitake ngā matapae, ngā rohenga.

Kōrero Āpiti

1 E whai ake nei ngā whakamārama o ngā tino kupu, kīanga rānei:

raraunga houanga	Ngā rahinga e whakaatu ana, e whai haere ana rānei i ngā uara o tētahi taurangi i te takanga o tētahi wā pērā i te marama, i te toru marama, i te tau rānei.
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Kuputaka:

aroā tauanga

statistical insight

tauirā tāpiripiri

additive model

tikanga hīkaro tauanga

statistical inferencing techniques

tikanga tātari hōpara

exploratory analysis techniques

He Kōrero mō te Whakakapi

Koinei hei whakakapi i te paerewa 5257 me te paerewa paetae 90641.

Tātari Kounga

- 1 Me mātua whakamana ngā Kaituku Akoranga me ngā Whakahaere Whakangungu Ahumahi e te Mana Tohu Mātauranga o Aotearoa ka rēhita ai i ngā hua ka puta mai i ngā aromatawai ki ngā paerewa paetae.
- 2 Ko ngā Kaituku Akoranga me ngā Whakahaere Whakangungu Ahumahi kua mana, ā, e aromatawai ana i ā rātou hōtaka ki ngā paerewa paetae, me uru rātou ki ngā pūnaha whakaōrite e tika ana mō aua paerewa paetae.

Ko te tohutoro ki te Mahere Whakamana, Whakaōritenga hoki 0233